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[  TX2-1111  ||                                    ]
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[            || A Line Oriented Text               ]
[    DATE    || Editor  Used on  the               ]
[            ||     DECsystem-10                    ]
[  12/13/78  ||                                     ]
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[                                                 ]
[   AUTHOR:                                       ]
[                    John Thornton                ]
[_____]
```

AUDIENCE: DECsystem-10 Users

COMPUTER(S):   DECsystem-10

LEVEL: Part 1 - Introductory
                    Part 2 - Intermediate

REFERENCES: Supersedes CCIS Memo P21-1082, titled as above.

ABSTRACT:

     This memo is in two parts. Part 1 is designed as a brief
introduction to the most basic commands of SOS. It is intended that
Part 1 will give the novice user enough information to use SOS for
file creation and simple editing.

     Part 2 is for the more advanced user. It describes all of the
SOS commands in some detail.

25 Pages $0.50

INTRODUCTION TO SOS TEXT EDITOR

CONTENTS

INTRODUCTION TO THE SOS TEXT EDITOR

SOS is a line-oriented text editor that allows users to create and edit files on the DECsystem-10. SOS has three modes of operation: input mode -- for creating new files, edit mode -- for correcting a file line by line, and alter mode -- for editing character by character within a line.

SOS begins by assigning a number to each line of the file. When an editing action is to be taken, the line to be edited is referenced by its line number. SOS commands are simple to use. Normally, a command is a single letter followed by a line number or a range of line numbers. SOS allows you to create new lines, get rid of unwanted lines and correct parts of existing lines.

The SOS monitor command is used to run the SOS editor. The same command is used both for creating and for editing files. If the filename used does not exist in your directory, then SOS assumes you want to create a new file (Input mode). If, however, the file was previously created, then SOS assumes you want to edit the file (Edit mode).

This memo is in two parts. Part 1 is designed as a brief introduction to the most basic commands of SOS. It is intended that Part 1 will give the novice user enough information to begin using SOS for file creation and for simple editing. Part 1 begins with definitions of some words and symbols used in this memo. Then the most common commands of the three modes are explained.

Part 2 is for the more advanced user. It describes several topics and the SOS commands involved. The topics include backup files, paging and pointer movement. There is a great deal of information included in Part 2. Therefore, it may be desirable to study topics as they are needed. The appendices are designed to be quick reference charts for the commands and parameters of SOS.

PART 1

DEFINITIONS

escape   escape is entered by pressing the escape key
                        (labelled ESC) when working at a DECwriter, or by
                        typing control-[(left bracket). NOTE: When the
                        escape key is pressed, the computer will type a $
                        indicating that escape was entered. However, the $
                        key does not give the same results as pressing the
                        escape key. All $'s in this memo represent pressing
                        the escape key.

<cr>   represents a carrier return, i.e., pressing the
                        RETURN or NEWLINE key. This key should be pressed at
                        the end of each line that is typed, whether a command
                        or input.

<space>   means the space bar is pressed.

<tab>   means the tab key is pressed.

<bksp>   means the backspace (labelled BKSP) key is pressed.

<line feed>   means the line feed is pressed or alternatively
                        control-J is typed.

<line number>   Any other item that is enclosed in angle brackets is
                        to be replaced by the appropriate value of whatever
                        is described. (All the angle bracket items used in
                        this memo are defined in Appendix A). For instance,
                        <line number> should be replaced by the line number
                        desired. Another example is:

                        <string> A string is any combination of characters
                                  (letters, numbers, blanks, punctuation
                                  marks, etc.). A string can contain zero or
                                  more characters and is normally ended by
                                  pressing the escape key.

prompt   SOS generally types out a symbol to indicate that it
                        is waiting for input or for a command (input when the
                        prompt is a line number; a command when the prompt is
                        an *). NOTE: alter mode does not give prompts.

Lines in the file can be referenced by either of the following:

                        1.   <line number> - an integer between 1 and 99999.
                        2.   <line number>:<line number> - to refer to a
                              range of lines.
                              100:400 means lines 100 through 400.

INPUT MODE

    This mode is used to type in a new file (program, data or
text). To enter this mode, give the SOS command followed by an
unused filename (for instance, SOS TESTB.FOR). SOS will respond
with a line number, after which the next line of the file is typed.
To exit from input mode, press the escape key; SOS will then enter
edit mode.

    To summarize, writing a new file involves three steps:

                        1.   give the SOS monitor command.
                        2.   type in the file, line by line, after prompts.
                        3.   press the escape key to leave input mode.

EXAMPLE: (underlined information was typed by SOS)

```
.SOS ONE.FOR
INPUT: ONE.FOR
00100    <TAB> I=1
00200    <TAB> TYPE 10,I
00300    10<TAB>FORMAT(I5)
00400    <TAB>END
00500    $  (THE ESCAPE CHARACTER)
*
```

EDIT MODE

Edit mode is entered either by giving the SOS command followed
by the name of a previously written file, or by pressing the escape
key while in input mode.   Edit mode will type out asterisks as
prompts.

EDIT MODE COMMANDS

P   Print (on the terminal) the lines indicated.

          P100
          P100:500

I   Insert the line indicated. (If the line number already exists,
     SOS will insert between that line and the following line).
     NOTE: SOS will continue to insert lines, incrementing by 100,
     until the next line is reached or until the escape key is
     pressed.

          I100
          I350

D   Delete the indicated lines from the file.

          D100
          D700:1000

R   Replace the indicated lines. Equivalent to deleting the lines,
     then inserting the same lines.

          R100 (equivalent to D100 then I100)
          R400:700 (equivalent to D400:700 then I400)

S   Substitute one string for another.   The format is S<old
     string> $<new string>$<line number>, where each string is
     ended by pressing the escape key. The effect is that the new
     string is substituted for the old string in the line indicated.
     NOTE: If the old string occurs more than once in the line
     indicated, each occurrence will be substituted.   For more
     information on this command, see Chapter IV of Part 2.

E   Exit from SOS (return to the monitor) and store the file.

W   "Save World," i.e., store the file as it is now, but continue
       editing.

ES   Strip (remove) the line numbers, then exit from SOS and store
       the file. This command must be used for data files. If not
       used, the line numbers remaining as part of the file will be
       treated as data. Note that if any editing is done, the line
       numbers may be different when SOS is reentered.

A   Alter the lines indicated, one by one (enter alter mode).

ALTER MODE

       This mode is entered by giving the alter command while in edit
mode. While in alter mode, one can move back and forth within the
line, changing, deleting and inserting characters in the line. This
mode maintains a pointer which points to a character in the line.
The pointer may be moved by using any of the first four commands
below. The following four commands act on or before the character
indicated by the pointer. NOTE: Alter mode does not give prompts,
nor does it print the user's commands.

ALTER MODE COMMANDS

<space>   Pressing the space bar will move the pointer forward
                 one character.

<bksp>   Pressing the backspace key will move the pointer one
                 space backward.

l   (the letter l) This command will print the line and
                 return the pointer to the beginning of the line.

ns   Skip to the nth occurrence of the next character
                 typed.

                      2sc (Skip to the 2nd c after the pointer.)
                      st   (Skip to the 1st t after the pointer.)
                      3ss (Skip to the 3rd s after the pointer.)

nc   Change the next n characters (Following the command
                 type in the n new characters.)

                      ca   (Change the next character to an a.)
                      2cab   (Change the next 2 characters to ab.)
                      5cx-y/z (Change the next 5 characters to x-y/z.)

nd   Delete the next n characters.
                                d
                                3d

i   Insert, before the next character, whatever is typed next.
                        inserting when the escape key is pressed.

nr   Replace n characters, i.e., delete n characters (nd), then
                        insert (i).

\<I\>   Exit alter mode (return to edit mode).

EXERCISES

        The left column below is a series of commands to the various
modes of SOS.   (The SOS command is, of course, given to the
monitor.)   The right column describes the results of typing the
corresponding lines of the left column.   This exercise is designed
to help the novice gain experience in the use of SOS.

type this: to do this:

INPUT MODE

SOS FILEA.TST   Create a file with 5 lines in it.
AAAAA
BBBBB
CCCCC
DDDDD
EEEEE
$ (Press the escape key, not the dollar sign.)

EDIT MODE

P300   Print the 3rd line.
P300:500   Print lines 300 through 500.
I100   Insert a line after line 100.
ABABAB
D400   Delete line 400.
ES   Exit, stripping the line numbers off.
SOS FILEA.TST   Reenter SOS (edit mode).
P100:500   Print the whole file.   (Note that the line
                        numbers have changed.)
200   Replace line 200.
ZZZZZ
D300:400   Delete 2 lines.
I300   Insert new lines 300 and 400.
ABCD
ABCD
I700   Insert lines 700,800,. . .
FFFFF   Note that if there is room for the insertion of
GGGGG   another line (incrementing by 100), then SOS
HHHHH   will insert another line.
$ (Press the escape key, not dollar sign.)

R100	Replace line 100 with some numbers.
123451234512345	
A100	Enter alter mode for line 100.
	ALTER MODE - Note that commands do not print.
<space><space>	Move to the 3rd character of the line.
<bksp>	Move back to the 2nd character.
l	(the letter l) Print out the line.
	Return the pointer to the start of the line.
2s3	Skip to the 2nd 3 of the line.
c0	Change it to a zero.
d	Delete the next character.
sl	skip to the next l.
i000$	insert 3 zeroes before the l. (End the insertion by pressing the escape key.)
<cr>	End alter mode, return to edit mode.
P100:900	Print the entire file.
E	Leave SOS.

PART 2

CHAPTER I - BACKUP FILES AND EXITING SOS

When SOS is called upon to edit a file, SOS makes a copy of the file. All of the editing that you ask SOS to do is done on the copy.   The copy (the edited file) does not exist in your storage area until you ask SOS to store it. When you give the E or ES commands, SOS changes the name of the original file (by putting a Q in its extension). Then it stores the edited version with the original filename.

By leaving the original file stored and working on a copy, SOS has a "backup" file, a file you can go back to if anything goes wrong.   There are several variations of the E command which allow manipulation of these two files.

EQ   means, "Exit to the monitor and forget any editing that I have done," i.e., leave the file as it was before the SOS command was given. (Quit while you're ahead.)   To prevent catastrophes, SOS will ask, "Really?" making sure there is no mistake. If you then respond with anything but "Y" or "YES," SOS will return to edit mode (giving an * prompt). NOTE: If you give the EQ, YES combination for a file you are creating, the file will cease to exist, since you never stored it.

EB   is like the E command, except that no backup file is created.   Only the edited version exists after returning to the monitor.

E:<filename>   This command allows you to make the name of th
                 edited file different from the original. The
                 unedited version keeps its name; the filename given
                 in the command is used for the edited version.

                          E:FILE27.FOR
                          E:SAMPLE.DAT

ED   Asks SOS to delete the file entirely, i.e. after this
                 command is processed, the file being worked on will
                 no longer exist.

^C   (Control-C) This is another way to exit from SOS.
                 SOS will respond by typing "YES? (type H for help):",
                 asking you to choose one of six options:

                          C ---continue (cancel ^C request).
                          E ---like E in edit mode.
                          EQ---like EQ in edit mode.
                          M ---Return to the monitor. SOS can be restarted
                              by typing CONT to the monitor.
                          H ---type this list of options.
                          R ---reenter edit mode. (Terminate infinite
                              searches, etc.)

SUMMARY OF EXIT COMMANDS

    E   exit, store the edited file.
    ES   exit, but remove line numbers.
    E:<filename>   exit, but change filename.
    EQ   quit, do not store edited file.
    EB   exit, but no backup file.
    ED   delete the file and return to the monitor.
^C   problem exit.

                 CHAPTER II - POINTER MOVEMENT AND LINE REFERENCES

     SOS continually maintains a pointer, an indication of which
line was last referenced. A period (.) may be used to indicate this
current line, i.e., you may print the current line by giving the
edit mode command "P." This pointer is moved whenever a command
refers to a different line, i.e., P1200 moves the pointer to line
1200. Another way to move the pointer is with the point command.
The command consists of a period, followed by a line number. The
pointer is moved to the line indicated, i.e., the command ".2700"
moves the pointer to line 2700.

     You can also reference lines near the pointer by using the
formats .-n or .+n to indicate the nth line before or after the
current one (.+1 is the next line; .-10 is the tenth line before the
current one). Probably the most common commands are P.+1 and P.-1,
so SOS has special forms to simplify these commands. Pressing the

line feed key (or control-J instead) prints the next line
(equivalent to P.+1); pressing the escape key when in edit mode
prints the previous line (equivalent to P.-1). Two other commonly
referenced lines are the first and the last lines of the file. Just
as the period refers to the current line, an up-arrow (^) means the
first line, and an asterisk (*) indicates the last. You can also
refer to lines by ^+n or *-n.

Now you can refer to lines of a file in several ways. You can
use the line number or one of .^*, optionally with a +n or -n. You
can refer to a range of lines by using the format <line>:<line>,
where the colon separates two line specifications. One more way to
describe a range of lines is to indicate a number of lines beginning
with a particular line by using the format <line>!n.

EXAMPLES: P.!5   Print this line and the next four.
            P^:*   Print the entire file (Page 1 of a paged file).
            P.-2:+.2   Print 5 lines beginning 2 before current line.
            D.   Delete the current line.
            D*-1   Delete the next to last line.
            D^!3   Delete the first three lines.

SOS simplifies looking at segments of a file with a special
form of the print command. The print command with no arguments
(i.e., "P") prints the current line and the next 15 (i.e.,
equivalent to "P.!16").

If you wish to print lines without their line number, we can
use any form of the print command with the S option. This option is
obtained by adding ",S" to the end of the command. For instance,
you can say P100:900,S or P350!15,S or P,S. NOTE: After this
command, the asterisk may not print out. Push <cr> to get it.

You may want to move the pointer to the line where a particular
word or phrase is. The find command (F) accomplishes this. The
format is F<string>$<range>, where<string> is the word or phrase to
be found, followed by the escape character, followed by the range of
lines to be searched. The command instructs SOS to search for the
word or phrase indicated, to print the first line where it occurs,
and to move the pointer there. If no occurrence is found, SOS types
"%SEARCH FAILS." For example, FWIRE$100:1500 means find the first
occurrence of the word "WIRE" in lines 100 through 1500.

Omitting the range from the F command causes the search to
cover from the current line until the end of the file, i.e., <range>
is assumed to be ".:*". If no arguments are given, SOS will search
for the next occurrence of the same <string> as used in the last F
command.

The find command also allows multiple search strings. If you
wish to search for two strings, include both strings, separated by a
carriage return. (The second string is ended by pressing the escape
key). This format of the command searches for the first occurrence
of one string or the other.

The find command also has several options available. Each option is obtained by following your command with a comma and the appropriate letter (or number), e.g. FABC$^:*,A. The following are the available options:

A   Enter alter mode when the line is found, position the pointer immediately before the string that was found.

D   Decide mode. After finding a line, SOS will type out "D*", allowing you to then choose the next action to be taken. Responses include <space> (meaning "OK, continue searching", if the, n option below was used); G (meaning "OK, but no more searching"). The other responses are A,I,K,M,R,X with the meanings described in this list.

E   Find an exact match of the string being sought. Normally SOS does not differentiate between upper and lower case letters. With this option SOS will not find a match unless it is an exact match.

I   Insert a line immediately following the line found.

K   Delete the line found.

M   Insert a page mark immediately before the line found.

N   Only type back the line number of the line found.

n   (where n is a number) find n lines containing the string.

R   Replace the line found.

X   Extend the line found, i.e. add to the end of the line.

SUMMARY OF POINTER MOVEMENT COMMANDS

```
.<line>                                Move the pointer.
F<string>$<range>                      Find the string and move pointer.
F<string><cr><string>$<range>          Find one string or the other.
 <line feed>                           Print the next line (P.+1).
  escape                               Print the previous line (P.-1).
  P                                    Print 16 lines (P.!16).
```

CHAPTER III - INSERTION

The insertion of lines in SOS can be a tricky business, but it helps to keep these rules in mind:

1.   If the line number indicated does not exist, SOS will insert a line with the number given.
2.   If the line number indicated does exist, SOS will insert a line between that line and the next line.

3.   If SOS can insert a second (,third,...) line while incrementing
      by 100 (or current increment, see below), it will continue
      inserting until another line will not fit. This can occur if
      several lines were previously deleted near the insertion point.
4.   If an insert command is given for the end of the file (i* or
      equivalent), SOS enters input mode, i.e. continues inserting
      until the escape key is pressed.

NOTE: These rules apply to the replace command as well.

      There are several special formats of the insert command:

I<line>;<increment>   Insert some lines incrementing by the value
                             given instead of by 100.

                                   I1200;25
                                   I300;5

I<line>,<increment>   Like   above   but   the   new   increment   is
                             permanent, i.e., use the new increment
                             value in any subsequent insert commands.

                                   I700,10
                                   I1500,200

I<line>;!n   Insert n lines at position indicated. SOS
                             will calculate an appropriate increment.

                                   I2650;!7
                                   I100;!20

I/n   Insert a page mark at the end of page n and
                             do an I100 for a new page. This command
                             simplifies the insertion of pages, each
                             beginning with line number   100.   (See
                             Chapter VIII)

                                   I/13
                                   I/2

I   If no line number is given, SOS will use
                             the last number used, i.e. SOS will insert
                             a   line immediately following the most
                             recently inserted line.

I*   Since * indicates the last line of a file,
                             I* means insert after the last line, i.e.
                             add lines to the end of the file.

SUMMARY OF INSERT COMMAND FORMATS

```
I<line>             Insert at or after the line indicated.
I<line>;n           Insert with temporary increment n.
I<line>,n           Insert with permanent increment n.
I<line>;!n          Insert n lines after <line>, compute increment.
I/n                 Insert a new page immediately after page n.
I                   Insert after most recently inserted line.
I*            ..    Insert at the end of the file.
```

CHAPTER IV – SUBSTITUTION

Rather than replacing an entire line or getting into alter mode to correct the line, the correction can be done by substitution. The substitute command allows you to specify a string of characters that are in error and the string that is correct, then have SOS do the work:

s<old-string>$<new-string>$<range>

where $ represents the escape character. Every occurrence of the old string in the range indicated is replaced by the new string.

For instance, sINAT100:300 specifies that every occurrence of the character combination "IN" in lines 100 through 300 is to be replaced with "AT". You must always take care to give a specific enough <old-string> so that no unwanted substitutions are made. In the example given, each word IN is replaced by AT. However, words like LINE and COPYING (if present) would also be changed (to LATE and COPYATG).

The substitute command allows multiple substitutions in one command. Several <old-string>'s and the same number of <new-string>'s can be included in the command, each terminated by a carriage return except that each group (new and old) is terminated by the escape characters. In this case, SOS will substitute the first new string for each occurrence of the first old string, the second new string for each occurrence of the second old string, and so on. For example: SWERE<cr>WAS$ARE<cr> IS$100:500

With all these various formats, it is easy to goof while typing a substitute command. Since this command includes the escape character, we need a special way of cancelling a fouled up command and that is to type two control-G's (producing two "bells").

There are also several options for the substitute command. These options are used by ending the command with a comma and a letter. SOS normally does not differentiate between upper and lower case characters. The ,E option asks for an exact match of upper and lower case. If ,N is used, SOS will only type out the line numbers of lines that are changed. There is also a decide option (,D). This option says that you wish to confirm each substitution before

it is actually changed. When a substitution is made, the line is
printed out with the change, then SOS types "D*" as a prompt and
waits for a response. Allowed responses are:

<delete>   meaning cancel this substitution (continue searching
                    the other lines in the range
<space>   meaning allow this substitution (continue searching).
 G   meaning allow this substitution (no more searching).
 E or Q   cancel the substitution and return to edit mode.
 A   enter alter mode for the line (continue searching).

SUMMARY OF SUBSTITUTE COMMAND FORMATS

s<old string>$<new string>$<range>   substitute new-1 for old-1,
s<old string-1>   substitute new-1 for old-1,
 <old string-2>   new-2 for old-2,...
 <old string-3>$<new string-1>
 <new string-2>
 <new string-3>$<range>
s<old string>$<new string>$<range>,N   only type out line numbers
s<old string>$<new string>$<range>,D   confirm every substitution
s<old string>$<new string>$<range>,E   substitute only for exact
                                                match

CHAPTER V – COPYING LINES

     If a group of lines are found to be in the wrong place in your
file, or if a group of lines are repeated in the file (or in another
file), then you need to use one of SOS's copy operations. There are
three similar but distinct types of copy operations in SOS:
transfer a range of lines from one point in a file to another point;
duplicate a range of lines from a different point in the file;
duplicate a range of lines from a different file.

T<destination>,<range>   Place a copy of the lines
                                    indicated at or after the
                                    destination line and delete the
                                    original lines. If necessary,
                                    SOS will compute an appropriate
                                    increment.

                                         T1800,8500:9300

C<destination>,<range>   Similar to the Transfer command,
                                    except that the original lines
                                    are not deleted.

                                         C1800,8500:9300

C<destination>=<filespec>,<range>   The lines of the file indicated
                                    are copied to the destination in

                              the   current   file.   <filespec>
                              represents   the   appropriate
                              DECsystem-10 file specification.

                              C1800=FILE23.DAT,2000:3000

    If SOS cannot find an increment that will allow all the lines
to be copied, it will copy all the lines, numbering them
100,200,300,....Then the message "incl=order" is printed indicating
that there is a line number problem. This problem is straightened
out by renumbering the lines (See Chapter VII).

    If you cannot remember exactly which lines you want to copy
from a different file, SOS will allow you to look at the file before
doing the copy. The following format:

                    C<destination>=<filespec>/s

allows you to enter the second file in READONLY mode. READONLY
means that you can print lines or enter alter mode to examine a
line, but you cannot use any SOS command which will change the file
(SOS prompts with "C*" to remind you). When you know which lines
you want to copy, give the E command to return to your editing file.
SOS will then ask "Source lines=" so that you can complete the copy
operation.   If you decide not to copy any lines while reading the
file, type EQ to abort the copy command.

SUMMARY OF COPY COMMANDS

T<destination>,<range>   Transfer some lines.
C<destination>,<range>   Copy some lines
C<destination>=<filespec>,<range>   Copy from another file.
C<destination>=<filespec>/S   Copy, but first examine <filespec>
                                    READONLY mode.

                    CHAPTER VI - JOINING LINES

    When working with text files, there are customarily times when
a line is too long or too short. SOS has a pair of "join" commands
which help to solve this problem. One join command is in edit mode
and the other is in alter mode.

J<line>   (edit mode) Combine the line indicated with the
                   following line. The second line is deleted.

                        J1300
                        J.

j   (alter mode) Take all of the characters to the right
                   of the pointer and insert them at the beginning of
                   the   next line, making the current line shorter and

        the following line longer.   After   the   command   is
        executed, SOS will be in alter mode for the following
        line with the pointer at the beginning of the line.

SUMMARY OF JOIN COMMANDS

J<line>   edit mode join. Combine two lines into one.
j   alter mode join. Join rest of line to next line.

                CHAPTER VII – RENUMBERING LINES

     It is sometimes desirable or necessary to renumber the lines of
a file. For instance, if a great deal of editing has been done,
lines have been inserted and deleted, the line numbers may no longer
be as convenient as 100, 200, 300, ...   On the other hand, some
other regular numbering system may be desired. Either change can be
accomplished with the Number commands:

N<increment>,<range>,<first line number>
     Number the lines in the range indicated. Begin numbering with
the first line number given and increment by <increment>.   If no
arguments are given (e.g., "N"), SOS assumes standard line numbers
are desired (increment = 100, first line number = 100, range is the
entire file).
                     N
                     N100,685:862,700
                     N5,^:*,5

NA<increment>,<range>
     Add   the   increment value given to each of the line numbers in
the range indicated. This command is normally ·used when so much
inserting has been done between two lines of the file that there is
no more room for insertion.

                     NA50,2005:2100

     When numbering is done to a paged file (See Chapter VIII), SOS
begins each page with <first line number>, that is, the (standard)
first lines of each page are each numbered 100. If you would rather
have the line numbers continue incrementing over page marks, use the
following command:

NP<increment>,<range>,<first line number>
     Number the lines in the range indicated beginning with <first
line number> and incrementing by <increment>.   Do   not   reset to
<first line number> at beginning of pages. i.e., keep incrementing.
Again no argument means standard values. (See Chapter VIII for   an
explanation of the second example).

                     NP
                     NP10,^/1:*/5,10

SUMMARY OF NUMBER COMMANDS

N<increment>,<range>,<first line number>   renumber the lines in
                                           <range>.
NA<increment>,<range>   add to each line number.
NP<increment>,<range>,<first line number> N, but increment at page
                                           mark.

CHAPTER VIII - PAGING

SOS   allows   you to group the lines of a file into pages.   This
ability is   normally   used   for   text   files.   Another   reason   for
understanding   paging   is   for   editing   paged   files, such as those
produced by RUNOFF, the DEC-10 text formatter.

Each   page   of   an SOS file can contain any number of lines, as
you have seen from the one-page files you have   been   dealing   with.
When editing paged material, line numbers refer to the current page,
unless a different page is indicated.   The page is   indicated   by   a
slash   followed   by   the   page number.   For instance, p100/2 says to
print line 100 of page 2.   Any subsequent commands now refer to page
2 until another page number is given.   SOS puts a "page mark" at the
beginning of each page.   The mark is only printed if   it   is   inside
the   range   of   lines being printed.   Note that ^ and * refer to the
first and last lines of the current page, i.e., P^:* will print only
the   current page.   Just as "^", "." and "*" refer to the first, the
current and the last lines of the page, /^ refers to the first   page
of   the   file,   /. to the current page, and /* to the last page.   An
entire paged file may be represented as ^/^:*/*.   If   you   wish   to
refer   to   one   entire   page (to   print,   delete,   etc.),   no   line
indication is needed, i.e., "P/3" will cause all of   page   3   to   be
printed.

The   following   commands   allow   you   to separate material into
pages or to "unpage" paged material:

M<line>   Insert   a   page mark immediately before the line
                        indicated.   The   page   number   of   any   lines
                        following the new page mark is increased by 1.

                                M5100
                                M6375

K/<page number>   Delete the page mark indicated.   Any larger page
                        numbers are decreased by 1. The   page   indicated
                        and   the one before it are merged into one page.
                        You may also delete a range of page   marks   with
                        the format:

                                K/<page#>:/<page#>
                                K/3
                                K/4:/6
                                K/10

The normal line numbering scheme for paged files has the first line of each page labelled 100, the second of each page 200, and so on. If a page mark is removed, therefore, the resulting page will have two line 100's, two line 200's, etc. SOS indicates this problem by stating, "%OUT OF ORDER." The cure for this problem is to renumber the lines. (See Chapter VII on renumbering.)

SUMMARY OF PAGING COMMANDS

M<line>   Mark a new page.
K/<page number>   Kill the page mark.
K/<page#>:/<page#>   Kill the range of page marks.

CHAPTER IX - CASE CHANGES

When editing text files, you may need to work with both upper and lower case letters. Normally this is accomplished by giving the SET TTY LC monitor command before entering SOS. When doing just one or two changes, however, it is common to forget to give the command. So, SOS has some new commands to change the case of letters. There are three new edit mode commands and three new alter mode commands. These commands allow you to change lower case letters to upper case, to do the reverse, or to invert the case of each letter encountered. Note that these commands affect only the letters encountered; they have no effect on digits or special characters.

In edit mode, the commands act on each letter in the range of lines that you specify. The command VL, followed by a range of lines, changes all letters to lower case. The command VU changes all letters to upper case. The command VV inverts the case of each letter. That is, any lower case letters encountered are changed to upper case and vice versa.

VL100:200   change all letters in lines 100 through 200 to lower case.
VU700:1000 change all letters in lines 700 through 1000 to upper case.
VV400:600   invert the case of all letters in lines 400 through 600.

In alter mode, there are three analogous commands. However, these commands function character by character rather than line by line. > is the command to change the next character (if it is a letter) to lower case, while < does the reverse. Either of these can be preceded by a number to repeat for more than one character. i.e. 4> means to change all the letters among the next four characters to lower case. If a negative number is used, the command functions towards the left. The invert case command is V, which means: if the next character is a a lower case letter, make it upper case and vice versa. Again a number can be used to repeat the command to the right (or left if negative). For example, -7V means to invert the case of the previous 7 characters.

SUMMARY OF CASE CHANGE COMMANDS

edit mode:
VL<range>   change all letters in range to lower case.
VU<range>   change all letters in range to upper case.
VV<range>   invert the case of all letters in range.

alter mode:
(-)n>   change all letters among the next (previous)n characters to
          lower case.
(-)n<   change all letters among the next (previous)n characters to
          upper case.
(-)nv   invert case of all letters among the next (previous)n
          characters.

CHAPTER X - MISCELLANEOUS EDIT MODE COMMANDS

The remaining operations of SOS edit mode are: listing lines on the line printer, extending lines (inserting at the end of the line), and an edit-execute sequence for program files. Some variations of the Save World command are also described here.

Listing.   A file or a range of lines will be sent to the line printer by SOS if the L command is given. "L" asks that the entire file be listed, while "L<range>" asks for just a range of lines to be listed. An "S" option allows the suppression of line numbers for the lines listed, that is, "L,S" and "L<range>,S" each specify that a group of lines are to be listed on the line printer without their line numbers.

Extending Lines.   A common use of alter mode is to add to the end of existing lines. The sequence of commands might be A100, <tab>(Skip to end of the line), then i (begin inserting). The extend command in edit mode (x) has the same effect as this sequence of commands.

X<range>   One by one, print the lines and wait for insertion at
                  the end of each line. You are, at this point, in
                  alter mode, so that pressing the escape key will end
                  the insert and allow alter mode commands to be used.

                          X1250
                          X.+1!10

If you do not want the current line typed out, use the S option, e.g., X300,S. SOS will not type the line but merely wait for input.

Edit-Execute.   SOS is very handy for debugging a program, the sequence commonly being: create a program file, execute it, correct it, execute, correct, ... SOS simplifies this process by having an "execute" command in edit mode. After the first execution, you will probably give the monitor command "SOS". (The filename is remembered from the last SOS command.) After all

apparent corrections are made, you may give the edit mode command
"G". Just as the execute and SOS monitor commands remember the last
file used, the G command instructs the computer to re-execute the
last program that was executed (probably the one you are editing).

The command sequence (after the incorrect first execution of a
program) could be: "SOS", then whatever editing commands are
needed, then "G" to execute the program, repeating until the program
works. NOTE; The G command has the same variations as the E
command, i.e., GS, GB and G:<filespec>. (See Chapter I for
description.)

Save World.   The Save World (W) command allows you to
store the current version of your file and to continue editing.
This command has the same variations that the E command has, i.e.,
WS, WB and W:<filespec>. (See Chapter I for description.) The W
command can be made automatic also. The SAVE option generates an
auto-w command after the specified number of edit mode commands.
the ISAVE option generates an auto-w command after the specified
number of input lines. (See Chapter XI for more description.)

SUMMARY OF MISCELLANEOUS EDIT MODE COMMANDS

L<range>   List the range of lines.
L   List the file.
L,S   List without line numbers.
X<range>   Extend the lines one by one.
X<range>,S   Extend, but do not type out lines.
G (GS, GB, G:<filespec>) Go and execute.
W (WS, WB, W:<filespec>) Save world.

                    CHAPTER XI - MISCELLANEOUS ALTER MODE COMMANDS

In Part 1 of this manual, alter mode commands were classified
as three types: pointer positioning, action and finishing commands.
Here we introduce five more positioning commands, four more action
commands, and three more finishing commands.

Each previously described pointer positioning command has
another similar command.

n<space>   Move the pointer n spaces forward (right).

n<bksp>   Move the pointer n spaces backward (left).

p   Type out the line, then return the pointer to the
                 current position.

nw   Skip forward n words. The pointer, after execution will be at the first character of the nth word after the current word.

<tab>   Pressing the tab key causes the pointer to move to the end of the line. If a minus sign is typed first, the pointer moves to the start of the line.

    Two of the action commands presented here are alternative methods for replacing and deleting information in the line. Another is a variation of the insert command.

T   Replace one word. This command deletes the spaces to the right of the word, so you may want to reinsert them.

nk<character> Delete all of the characters up to, but not including, the nth occurrence of the character. -nk<character> will delete to the left of the pointer. If there is no occurrence, the pointer will not be moved.

                kc (delete until the first c)
                3kt (delete until the third t)
                -5k0 (delete backwards until the fifth 0)

nu   Delete n words. More precisely, delete from the pointer to and through the nth group of one or more spaces.

x   Extend the line, i.e. move the pointer to the end of the line and initiate an insert. If this command is preceded by a minus sign, SOS will type out the line number and initiate an insert at the beginning of the line.

Note that nine alter mode commands allow a negative n value to be specified. The nine are D, K, R, S, V, X, <tab>, < and >. Each of these allows correction to the left of the pointer.

    SOS has a special feature which allows you to insert a new line while in alter mode. If a <line feed> is entered (by pressing the Line Feed key or Control-J) as part of text for the insert command, SOS will generate a new line number (by incrementing or computing one if necessary). Any additional text will be inserted into the new line. New lines may be continually entered until the escape key is pressed or there is no more room for a new line number. A special form of the alter mode insert commands allows you to specify the increment for the new lines:

ni   Insert text; ended by pressing the escape key. If any new lines are started using the line feed key, use n for the line number increment.

Three additional finishing commands:

e   Leave alter mode, but do not print the remainder of the line.
q   Quit, leave alter mode, but undo any corrections made.
^u   Cancel any corrections just made, but begin the alter again.

SUMMARY OF ALTER MODE COMMANDS

n<space>	Move pointer right.
l	Print pointer to start.
(-)ns<character>	Skip to nth occurrence.
(-)<tab>	Skip to end/start of line.
nc<string>	Change n character
ni<string>$	Insert (increment n).
(-)nk<character>	Delete to nth occurrence.
<cr>	Leave alter mode.
q	Quit, undo corrections.
n<bksp>	Move pointer left.
p	Print, pointer same.
nw	Skip n words.
nu	Delete n words.
(-)nd	Delete n characters
(-)nr<string>$	Replace n characters.
t	Replace one word.
(-)n>	Change n characters to lower case.
(-)n<	Change n characters to upper case.
(-)nv	Invert the case of n characters.
(-)x	Extend the line.
e	Leave without printing.
^u	Quit and begin again.

CHAPTER XII - SWITCHES AND PARAMETERS

SOS has a series of options available. Each of the options may
be set as a switch in the "SOS" command. To use a switch, follow
the filename with a slash and then the option name, e.g., "SOS
FILE27.DAT/EXPERT." More than one switch may be used in one
command.   The options may alternatively be set while in edit mode.
In edit mode the format is to type the underline character (_),
followed by the option name. (On ADDS terminals, the left arrow is
used.)

There are several options which are set to a value instead of
on or off. These are set by following the option name with a colon
and the value desired (e.g., increment:10).

OPTIONS:

BAK   Create a backup file, i.e., store the unedited
                 version of this file in a file whose extension begins
                 with a Q. This option is the default.

BASIC   The file was written with BASIC (the format of line numbers is different). This is assumed for a file whose extension is .BAS.

BLOCK   Create a line-blocked file. This is the default.

C64   64 character set.

C128   128 character set.

COMPRESS   Remove form feeds, etc from text to get a "compressed" file.

DECIDE   Confirm any substitution made. Equivalent to the ,D option of the substitute and find commands. (See Chapters II and IV for more explanation.) The default is NODECIDE.

DELETE   Delete the file upon exit from SOS. To prevent tragedies, SOS will ask "Do you really want to delete the file (Y or N)?" before proceeding.

EXACT   Normally SOS does not differentiate between upper and lower case when doing string searches, i.e. the find command for the string THE will "find" The, the, etc. If the EXACT option is turned on, however, SOS will only find an exact match of upper and lower case.

EXPERT   This option causes certain things not to be typed while using SOS. When characters are deleted or replaced in alter mode, they will not be typed out surrounded by slashes as usual. This allows the line to appear as it actually is, without deletion indicators. If an error occurs, just a three-letter abbreviation is typed instead of the entire message. Also no confirmation of questionable commands is asked (e.g., "Massive delete OK?"). The opposite of this option is NOVICE, which is the default.

INCREMENT:n   Change the line number increment to n. Default = 100.

ISAVE:n   Automatically execute a Save World command (W) after every n lines of input. Default = 0 (never).

LOWER   Interpret all letters as lower case instead of upper case. This option does not give both upper and lower case; only the "SET TTY LC" monitor command accomplishes that.

NAME:newname   Change the name of the edited file to the name given. The backup file keeps its original name. Using this option has the same effect as the E:filename command (Chapter I).

NOBAK   Do not create a backup file. The only file will be
                     the edited version. Using this option has the same
                     effect as the EB command (Chapter I).

NOBLOCK   Turn off Block.

NOCOMPRESS   Turn off COMPRESS. This is the default.

NODECIDE   Turn off DECIDE. This is the default.

NODELETE   Turn off DELETE. This is the default.

NOEXACT   Turn off EXACT. This is the default.

NONUMBERS   Do not print line numbers. The lines are numbered as
                     always, but the numbers are not printed. The default
                     is NUMBERS.

NOVICE   Turn off EXPERT. This is the default.

NUMBERS   Turn off NONUMBERS. This is the default.

OLD   This option will cause SOS to store your unedited
                     file with a different extension than the normal
                     backup file (by replacing the first letter of the
                     extension with a Z). If you do a lot of editing, you
                     can store your original file as a Z file, then your
                     normal backup file (Q in extension) is an
                     intermediate version.   The Z file remains as the
                     original.

OPTION:option-name   If you have several favorite switches, they may
                     be made defaults (for you) by creating a file
                     named SWITCH.INI with a line in it of the
                     following format:

                          SOS/Switch/Switch...

                     If you have an alternative favorite set of
                     switches, enter a line into SWITCH.INI with the
                     following format:

                          SOS:option-name/Switch/Switch...

                     Now when you enter SOS, you will get your
                     default switches. When you use the OPTION
                     Switch, however, SOS will look in SWITCH.INI for
                     a matching SOS:option-name line and use those
                     switches instead.

PLINES;n   The print command with no arguments (i.e., "p") is
                     normally equivalent to p.!16 (print 16 lines).   The
                     number of lines printed is changed to n by this
                     option. Default = 16.

READONLY   Enter readonly file. In this mode, any command which
(or RONLY)   would alter the file is illegal. This option cannot
(or R)   be turned off while in SOS. Default is off.

RUN:program-name Normally, when an edit mode G command is given, the
                  COMPILE system program is run after exiting from SOS.
                  With the RUN option, you can specify a different
                  system program to be run, e.g. RUN:RUNOFF.

SAVE:n   Automatically execute a Save World command (W) after
                  every n edit mode commands. Default=0(never).

SEQUENCE   Turn off UNSEQUENCE. This is the default.

START:n   Change the first line number to n. Default = 100.

STEP:n   Set increment to n. Default = 100.

UNSEQUENCE   Remove line numbers when the file is stored. This
                  option has the same effect as the ES command (Chapter
                  I).

UPPER   Turn off LOWER. This is the default.

     SOS will answer several questions about your job's status.
These questions are "asked" while in edit mode by typing an equals
sign, followed by the "question," e.g., =ERROR.

=.	What is the current pointer location?
=BAK	Is the BAK option on or off?
=BIG	How many pages in this file?
=BLOCK	Is the block option on or off?
=CASE	What case is SOS in?
=COLUMN	Type out numbers to label columns, simplifying the lining up of text.
=DECIDE	Is the DECIDE option on or off?
=DELETE	Will the file be deleted upon exit?
=DISK (or =DSK)	What is the current storage quota information?
=ERROR	What was the last error message given? (prints the full message even when in EXPERT mode).
=EXACT	Is the EXACT option on or off?
=INCREMENT	What is the current increment value?
=ISAVE	What is the current ISAVE value?
=LOCATION	What is the first location in the edit buffer?
=NAME	What will the name of this file be when stored?
=PLINES	What is the current PLINES value?
=RUN	Which system program will be after a G command
=SAVE	What is the current SAVE value?
=SEQUENCE	Is the SEQUENCE option on or off?
=START	What is the current START value?
=STEP	What is the current STEP value?
=STRING	What are the most recently used strings in the find and substitute commands?

APPENDIX A

ANGLE BRACKET DEFINITIONS

Several of the items surrounded by angle brackets merely mean
to press a particular key on the terminal keyboard:

\<cr>	carrier return (RETURN key or NEWLINE key).
\<tab>	tab key.
\<space>	the space bar.
\<bksp>	the backspace key.
\<linefeed>	the linefeed key (also CONTROL J).
\<delete>	the DELETE key.

The other items are to be replaced with whatever is described:

\<line number>   an SOS line number.

\<page number>   an SOS page number.

\<increment>   the number to add to a line number to get
                       the number for the next line.

\<1st line number>   the line number used for the first line of
                       the file or the first line of each page.
                       In the Number commands, the line number for
                       the first line being renumbered.

\<string>   any combination of zero or more characters,
                       usually ended by pressing the escape key.

\<filespec>   any   valid   DECsystem-10   filename   and
                       extension.

\<character>   any valid ASCII character.

\<destination>   any line indication telling where to place
                       copied or transferred information.

\<line>   a line indicator. Any of:
                       1. a line number.
                       2. . (the current line symbol) or .+n or .-n.
                       3. * (symbol for last line) or *-n.
                       4. ^ (symbol for first line) or ^+n.

\<range>   indication of a line or a group of lines.
                       Any of:
                       1. a line indicator (See \<line>).
                       2. \<line>:\<line>.
                       3. \<line>!n.

APPENDIX B

SWITCHES AND PARAMETERS

(For further description, refer to Chapter XII.)

BAK   Create a backup file.
BASIC   File is in BASIC format.
BLOCK   Line-block the output file.
C64   64 character set.
C128   128 character set.
COMPRESS   COMPRESS the output file.
DECIDE   Confirm env substitution.
DELETE   Delete file on exit.
EXACT   EXACT match of upper, lower case.
EXPERT   Work in expert mode.
INCREMENT:n   Change line increment to n.
ISAVE:n   Auto-w on input.
LOWER   Every letter in lower case.
NAME:newname   Rename the edited file.
NOBAK   No backup file.
NOBLOCK   Turn off line blocking.
NOCOMPRESS   Do not COMPRESS output file.
NODECIDE   No confirmation of substitution.
NODELETE   Ignore DELETE option.
NOEXACT   Don't differentiate upper, lower case.
NONUMBER   Don't type out line numbers.
MOVE   Return to MOVIE mode.
NUMBER   Begin typing line numbers again.
OLD   Create an old file.
OPTION:options Get set of switches from SWITCH.INI
PLINES n   Change number of lines for "p<cr>".
/R   READONLY mode. Can only be a switch in SOS command.
/READLY or /READONLY   "   "   "
RUN:program-name   Run program after G command.
SAFETY   Auto-w in edit mode.
SEQUENCE   Store with line numbers.
START:n   Set first line number.
STEP:n   Set line number increment.
UNSEQUENCE   Store without line numbers.
UPPER   Every letter in upper case.

EDIT MODE QUESTIONS:

=   What is current line number?
=BAK   Is BAK option on or off?
=SIZE   How many pages in file?
=BLOCK   Is BLOCK option on or off?
=CASE   Give case information.
=COLUMN   Type out column numbering.
=DECIDE   Is DECIDE option on or off?
=DELETE   Is the DELETE option on or off?
=DISK or =DISK What is current storage quota information?
=ERROR   What is most recent error message?
=EXACT   Is EXACT option on or off?
=INCREMENT   What is current increment?
=ISAVE   What is current ISAVE value?
=LOCATION   What is 1st location in edit buffer?
=NAME   What will filename be?
=PLINES   What is current PLINES value?
=RUN   What system program will a G Command run?
=SAVE   What is current SAVE value?
=SEQUENCE   Is SEQUENCE option on or off?
=START   Where is first line number?
=STEP   What is current increment?
=STRING   What were the most recently used strings for the find
                and the substitute commands?

APPENDIX C

EDIT MODE COMMANDS

Refer to Page:

.<line>	Move pointer.	8
A<range>	Enter intraline edit mode for lines, one by one.	5
C<destination>,<range>	Copy range of lines to destination.	13
C<destination>=<filespec>,<range>	Copy from another file.	13
D<range>	Delete lines	4
E	End, save the file, return to the monitor.	5
EB	E, but don't save a Backup file.	7
EQ	E, but don't store new (edited) file; Quit.	7
ES	E, but strip line numbers.	5
F<string>$<range>	Find string and move pointer there.	9,10
G	Go, execute last file executed.	18
I<line>	Insert a line or lines.	4,10,11
J<line>	Join this line and the following line.	14
K/<page number>	Kill the page mark indicated.	16
L<range>	List (on LPT) the lines indicated.	18
M<line>	Put a page mark before the line indicated.	16
N<increment>,<range>,<start>	Renumber using the values given.	15
NA<increment>,<range>	Add increment to each line number.	15
NP<increment>,<range>,<start>	N, but don't restart numbers at new page.	15
P<range>	Print lines.	4,8,9,16,23
R<range>	Replace lines.	4,11
S<old string>$<new string>$<range>	Substitute new string for old.	4,12,13
T<destination>,<range>	Transfer lines to destination.	13
VL	Change letters to lower case	17,18
VU	Change letters to upper case	17,18
VV	Invert case of letters	17,18
W	Save World, continue editing.	5,19,22,24
X<range>	Extend, add at end of each line.	18

APPENDIX D

ALTER MODE COMMANDS

Refer to Page:

Command	Description	Page
n\<space>	Move pointer n characters right.	5, 19
(-)\<tab>	Move pointer to end (start) of line.	20
n\<bksp>	Move pointer n characters left.	5, 19
l	Print rest of line; place pointer at beginning.	5
p	Print rest of line; place pointer at current position.	19
(-)ns\<character>	Skip to the nth occurrence of \<character>.	5, 20
nw	Skip forward one word.	20
nc\<string>	Change n characters to those indicated.	5
(-)nd	Delete n characters.	6, 20
(-)nk\<character>	Delete to the nth occurrence of \<character>.	20
i\<string>$	Insert the string (end with escape).	6, 20
(-)nr\<string>$	Replace n characters (end with escape).	6, 20
nu	Delete n words.	20
t\<string>$	Replace one word (end with escspe).	20
j	Stick remainder of line at start of next.	14
(-)x	Extend, insert at end (Start) of line.	20
(-)n>	Change n characters to lower case.	17
(-)n<	Change n characters to upper case.	17
(-)nv	Invert case of n characters.	17
\<cr>	Exit from alter mode.	6
q	Quit, cancel any editing.	21
e	Exit, but don't print rest of line.	21
^u	Quit and start again.	21